Original Research

Integrating Technopreneurship Education in Nigerian Universities: Strategy for Decreasing Youth Unemployment

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Abstract

As of the third quarter of 2018, the rate of unemployment stood at 23.13 percent as revealed by the National Bureau of Statistics. In view of the foregoing, this study proposes technopreneurship education as an effective strategy that can be used to reduce unemployment. Sequential mixed-methods research designs (quantitative and qualitative) were adopted for the study. The population for the quantitative part consists of 300 level students of universities in Kwara State, while lecturers and artisans in the universities formed the population for the qualitative part. Stratified, quota and random techniques were used to select 370 respondents while purposive and convenience techniques were adopted to select two lecturers and artisan. Research instruments titled "Technopreneurship Education and Business Intention Questionnaire (TBQ) and "Interview Protocol on Technopreneurship Education and Business Intention Questionnaire (IPTEQ)" were used to collect relevant data. Findings from both quantitative and qualitative methods revealed that the three dimensions of technopreneurship education (i.e., entrepreneurship course, entrepreneurship practical and internet facility) were significantly related to business intention. Also, findings show that inadequate facility and financial constraint constitute challenges that hinder technopreneurship, while adequate facility and

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availability of funds were perceived as the remedies to the challenges. Based on the findings of the study, it was recommended that government, banks and other stakeholders in education should assist universities in terms of providing financial assistance to students with business intention.

Keywords: *Technopreneurship Education Model, Entrepreneurship, Business Intention, Nigerian Universities*

Introduction

With high rate of joblessness and vulnerable employment on the upsurge, the world of work in Africa is confronted with terrific challenges in terms of job creation (International Labor Organization [ILO], 2016). Recent report released by the ILO indicates that youth unemployment rate in Africa is projected to exceed 30% in 2019 and that young people will continue to be 3.5 times more likely to be unemployed than adults (ILO, 2019). The Sustainable Development Goal (SDG) target 8.5 has revealed that despite low unemployment rates and high labor force involvement, working poverty, unemployment and job quality obviously remain significant challenges (United Nations Development Programme [UNDP], 2019). Narrowing youth unemployment in Africa to sub-regions, the unemployment rates forecasted for 2019 ranged from 27.3% for South Africa, 1.8% for Ethiopia, 18.2% for Bostwana, and 6.0% for Nigeria (ILO, 2019).

With reference to the growing population of Nigeria, which currently stands at 201 million, there is serious concern that if concerted efforts are not deployed to stem the unemployment trend, there is possibility of increase in social vices among the youth (United Nations Population Fund, 2019). Despite the incorporation of entrepreneurship education into Nigerian universities' curriculum as a way of reversing graduate unemployment trend by providing needed training in entrepreneurial skills so as to enable students to consider self-employment as a worthwhile career choice, little success has been recorded because graduates unemployment continue to skyrocket with 23.13% of unemployment rate as of 3rd quarter of 2018 (National Bureau of Statistics, 2018).

Due to accelerating economy in the world, improvement in science and technology continue to gain ground because it is acknowledged as a core competence in

accumulating wealth. From a business standpoint, there is a paradigm shift in various businesses because of the adoption of automated business process and communication channels that are designed to accomplish greater proficiency and success in business processing. This emergence of technological revolutions has unlocked new prospects and challenges to businesses (Mursityo et al., 2017; Rosly et al., 2015). The term technopreneurship is a derivative of two distinct words that is 'technology' and 'entrepreneurship'. The word technology is normally used to denote the practical application of knowledge as a framework that is used to create the required tools to develop expertise as well as materials with a view to solve the existing problems while 'entrepreneurship' comes from the word 'entrepreneur', which refers to a person that creates business with efficacy that bears the uncertainty and risk with a view to achieve profitability. Generally, technopreneurship means a process which involves merging technology competence with entrepreneurial capacity and skills (Lawal & Yusuf, 2019; Selvarany & Venusamy, 2015).

Success stories on technopreneurship has been documented in some of the countries in Europe and South East Asia, namely Italy, Israel, Singapore and Malaysia. For instance, Italy has performed better in terms of adoption of new innovations and establishment of collective agreement with some of their higher institutions; hence their government has achieved tremendous success in fostering the development of technology-based jobs (Colombo & Delmastro, 2002; Harsono, 2013; Susuki, Kim & Bae, 2002). In Israel, the country has created jobs through strong relationship between technology and research institutions. This led to the creation of synergy towards the achievement of entrepreneurial activity. Singapore has equally advanced technologically by adopting technopreneruship as a social movement that drives a fundamental shift in job creation by providing strong education system, internet access, and infrastructure. In the case of Malaysia, the country has shown rapid progress by establishing incubators and technology parks to nurture new businesses (Rothschild & Darr, 2013).

As documented in the National Policy on Education, Section 5, one of the goals of university education in Nigeria is to contribute to national development through the high level manpower training. Universities are also saddled with the responsibility of reducing skill shortages through the production of skilled human resources relevant to the needs of the labour market. The policy also states that universities shall make

optimum contribution to national development by making entrepreneurial skills acquisition a requirement for all Nigerian universities (Federal Republic of Nigeria, 2013). In order to address the anomaly in tandem with the SDG's 2030 Agenda for Sustainable Development adopted by the UN Member States in 2015, which specifically provides a shared blueprint for peace and prosperity for people and the planet, now and into the future, it is believed that merging of technology with entrepreneurship in Nigerian universities will help to produce multitude of technopreneurs that will help to fast-track the economic development of the country for prosperity (Aboluwodi, 2018; UNDP, 2019).

Since strategic decision making processes are getting demanding and complex in universities, there is need for policies that can be implemented to ensure that universities graduates are self-reliant and can create job opportunities. This requires methodology that can transform students into creative, innovative, and visionary leaders who understand the importance of technopreneurship in a changing global environment. In view of the foregoing, therefore this study proposes the integration of technopreneurship education in Nigerian universities as an effective strategy that can be used to decrease youth unemployment, banish poverty, and spur economic growth in Nigeria. With this aim, I have designed the following research questions to undertake this study:

1. What is students' perceived level of awareness on technopreneurship?

2. Is there any relationship between technopreneurship education and business intention among students?

3. What are the challenges facing technopreneurship education?

4. What measures can be used to address the challenges of technopreneurship education?

Likewise, I have devised the following research hypotheses.

H_1 There is significant relationship between school entrepreneurship course and business intention.

H_2 There is significant relationship between school entrepreneurship practical and business intention.

H₃ There is significant relationship between school internet facility and business intention.

H₄ There is significant relationship between technopreneurship and business intention.

Insights From Earlier Studies

Empirical studies have revealed that the use of technology contributes immensely to the success of technopreneurs in some of the countries in Asia and Europe. For instance, the study of Rosly et al. (2015) on perceived level of creativity of science and technology cluster students of University Technology Mara confirmed a strong link between the use of technology and entrepreneurial intention. It concluded that technology should be considered as part of the overall analysis in identifying entrepreneurial skills. The work of Kamarudin and Sajilan (2013) focused on factors that contributed to the success of technopreneurs in Malaysia using quantitative approach of data collection. Findings revealed that the factors that contribute to the success of technopreneurs include access to government's initiatives, financial resources, promotion and marketing, talent pool, technology advancement, diversification of products, networks and collaboration, and business location. Mursityo et al. (2017) examined the association between students' creativity in the use of technology and technopreneurship intention in Brawijaya University, Indonesia. Their findings revealed that creativity is significantly related with technopreneurship intention and concluded that students should be encouraged to adopt use of technology to complement their entrepreneurial skills for them to become technopreneurs. Similarly, Selvarany and Venusamy (2015) examined the relationship between innovation and small medium enterprises in India. Both survey and interviews were used to collect relevant data. Findings showed that businesses in India are technologically driven, which made technopreneurs to be increasing in India. Likewise, the study conducted by Suzuki et al. (2002) in Japan established that Japanese entrepreneurs have embraced advanced technology in growing their businesses. The country's entrepreneurs have four different unique dimensions, which include infrastructures, motivation, growth, and risk and obstacles.

Research conducted by Colombo and Delmastro (2002) established that Italy succeeded in developing their country by providing necessary facilities for businesses to thrive. They concluded that experienced incubation programs performed better in

terms of adoption of advanced technologies with collaborative activities with universities. Israel, an innovation-based country, is shaped through the connection between incubators and allied research organizations and this connection has produced synergy towards the achievement of entrepreneurial activity in the country (Rothschild & Darr, 2003). Harsono (2013) established that entrepreneurship education is required to build entrepreneurial human capital for university students, this will enable them to create business plans and initiate new business ventures. For universities to achieve that, they must have entrepreneurship programs and modules, as well as teaching methods to raise and motivate its students in terms of creativity, innovation and growth as a way of stimulating students to embrace technopreneurial opportunities.

Furthermore, extensive literature review indicates scanty research on technopreneurship and that the area is yet to be fully explored in Nigeria. The one that is closest to it was conducted by Lawal and Yusuf (2019) who focused on the relationship between use of online material, social media and intention. Nevertheless, a considerable number of empirical studies have been documented on the nexus between entrepreneurship and business intention. For example, Izedonmi and Chinonye (2010) found that entrepreneurship education is necessary for the development of students in universities and that their exposure to it is capable of stimulating students to become entrepreneurs. Abdulrasheed et al. (2019) assessed the impact of entrepreneurship course on business intention among undergraduate students and concluded that teaching of entrepreneurship course has an impact on students' knowledge and their entrepreneurial intention to start-up business. Another study was conducted by Bassey and Olu (2008) on the relationship between entrepreneurship education and intention in Nigeria using a sample of 690 respondents in three universities. The findings of that study showed a significant relationship between universities' entrepreneurship education and business intention among undergraduate students. Also, various studies investigated by Olokundun et al. (2014) and Uduak and Aniefiok (2011) all found significant relationship between entrepreneurship education and business intention among students.

Theoretically, both social network and human capital aspect of resource-based theory of entrepreneurship have been used to explain the connection between technology and entrepreneurship (Clausen, 2006; Shane & Eckhardt, 2003). The social network theory assumes that entrepreneurs are connected with social network structure

that creates a substantial proportion of their opening structure. Thus, it implies that a person may have the wherewithal to find that a certain entrepreneurial break exist, but may not have the social contacts to convert the chance into a business. Hence, access to social link helps to overcome this problem. In summary, the theory confirmed that stronger social connections to resource providers for opportunity exploitation (Aldrich & Cliff, 2003; Kim et al., 2003). On the other hand, the human capital theory posits that entrepreneurship is anchored on two factors, that is education and experience. Precisely, it is assumed that the acquisition of knowledge via experience and education indicates a resource that is heterogeneously dispersed through individuals and it is key to have clear understanding variances in business openings and identification (Anderson & Miller, 2003; Davidson & Honing, 2003; Kim et al., 2003; Korunka et al., 2003; Shane & Venkataraman, 2000).

In view of the above studies, it can be deduced that since entrepreneurship has been the focus of researchers in Nigeria, there is need for a paradigm shift, which necessitates merging of technology with entrepreneurship. Thus, the focus of the current paper is to propose technopreneurship education in universities as an effective strategy for reducing youth unemployment in Nigeria. Figure 1 shows the conceptual framework of the study.

Figure 1

Conceptual Framework of the Study
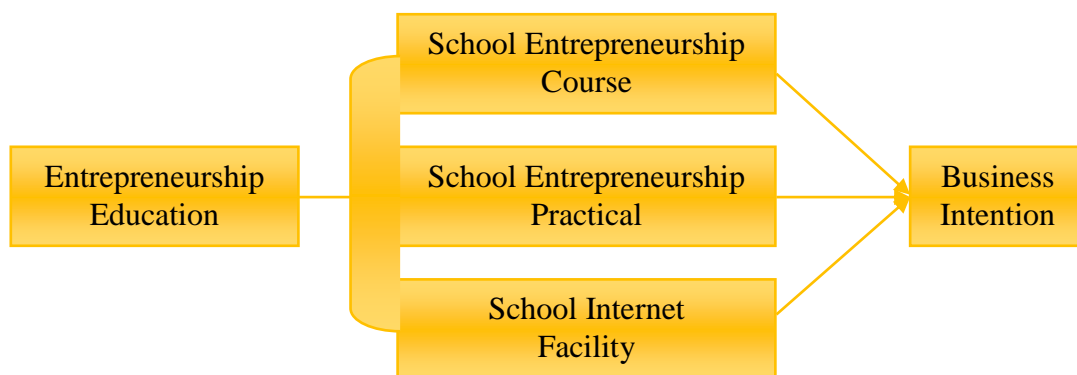
Methodology

In order to answer research questions raised in the study, the research design adopted for the study is sequential mixed-methods approach (quantitative and qualitative) so that comprehensive information can be collected. Specifically, the rationale for the inclusion of qualitative approach in the study is to support and complement the findings collected via quantitative approach (Sekaran & Bougie, 2010).

Quantitative Method

Following ideas were considered under the quantitative method.

Population/Sampling Techniques

The study population consisted of 10,648 300 level students of Al-Hikmah University, Kwara State University, and University of Ilorin who had just completed both the theoretical and practical aspect of entrepreneurship course in their respective universities. In line with Krejcie and Morgan's (1970), sampling table for 10,648 population, a sample size of 370 respondents was needed for the study. Also, stratified, quota and random sampling techniques were used to select 370 students from the three universities selected for the study (Creswell, 2012).

Variable Measurement and Instrumentation

In this study, technopreneurship education was the independent variable with three dimensions (school technopreneurship course, school entrepreneurship practical, and school internet facility). First, school entrepreneurship course in this study was described as those skills and knowledge which students acquired during their entrepreneurship class in school, under the tutelage of their lecturers (Harsono, 2013). Second, school entrepreneurship practical entailed the practical aspect of entrepreneurship which students were exposed to under the tutelage of entrepreneurs that were hired by the universities. Third, school internet facility implied students' access to school internet, which includes wifi, ICT unit and others which they used to display the products they produced on social media like Facebook, Whatsapp, Instagram, email, Imo, etc. (Rosly et al., 2015).

 The dependent variable in this study was business intention. In this context, business intention meant students' willingness to start business via the use of

technology (Colombo & Delmastro, 2002). An instrument titled "Technopreneurship Education and Business Intention Questionnaire (TBQ)" was adapted from Olokundun et al. (2014) and Tung (2011) to elicit relevant data from the respondents. To ensure validity of the instrument, it was given to experts in the field of entrepreneurship whose observations were corrected before the production of the final version. After that, a pilot study was conducted with 50 students to ascertain the reliability of the instrument with cronbach alpha of .832 for school entrepreneurship course (SC); .910 for school entrepreneurship practical (SP); .943 for school internet access (SI); .835 for business intention (BI).

Data Collection/Analysis Technique

Before administering questionnaire, consent form was sent to the three universities intimating them on the need for their student to partake in the study. Besides that, two research assistants were employed to make data collection easier. In line with Sekaran and Bougie (2010), a total number of 400 questionnaires were administered using cross-sectional approach. Both statistical Package for Social Sciences (SPSS) and PLS-SEM (Partial Least Square-Structural Equation Modeling) software were used for data screening and analysis respectively (Hair et al., 2014; Pallant, 2010). Specifically, SPSS was used for data screening and descriptive analysis, while PLS was used to assess the connection between the variables of the study.

Qualitative Method

Following ideas were considered under the quantitative method.

Population/Sampling Technique

The population of the study consisted of all lecturers and artisans who were in charge of the school entrepreneurship course and practical in the three universities with purposive sampling technique used to select Alhikmah University for the study. Also, convenience sampling technique was adopted to select two lecturers and artisans to partake in the study (Sekaran & Bougie, 2019).

Interview Protocol/Trustworthiness

According to Creswell (2012), interview protocol can be described as the document or guide that can be used to conduct the interview. It covers questions to be asked from the participants. For the purpose of the present study, interview protocol entitled "Interview Protocol on Technopreneurship Education and Business Intention Questionnaire (IPTEQ)" was used to elicit relevant information from the lecturers and artisans who were in charge of teaching students both theory and practical aspect of entrepreneurship education. Majority of the questions contained in the protocol were taken from the questionnaire used for the students who participated in the survey study. In order to ensure face validity of the protocol, it was given to experts in the field of entrepreneurship and all suggested corrections were effected accordingly. Also, a pilot study was conducted with one lecturer and artisan each with a view to ensure credibility of the protocol before the main data collection proper (Sekaran & Bougie, 2010).

Data Collection/Analysis Procedure

As suggested by Creswell (2012), the interviews were conducted with the participants with the use of biro and pencil, laptop, digital audio tape recorder, camera, jotter, and camera. Data collected were transcribed and analyzed using thematic approach.

The interviews were conducted with the two selected participants from Alhikmah University using the interview protocol designed for the study. The interviews conducted were subsequently transferred from digital audio tape to laptop for transcription with the use of digital headphone, biro and jotter within five days. At the end of the transcription, 8-page of participants' excerpts were produced with the use of printer. In line with the research questions and objectives of the study, the produced participants' excerpts were coded in consonance with the conventional method (thematic) of coding in qualitative studies (Creswell, 2012; Sekaran & Bougie, 2010). At the end of the coding process, three main themes and sub-themes formed the bases of analysis. Table 8 depicts the assigned code given to participants strictly for the purpose of the study. In the same vein, Table 9 shows the summary of the main themes and sub-themes generated via the coding procedure.

Table 1

Code Assigned to Participants

Participant	Code Assigned
Lecturer 1	LC1
Lecturer 2	LC2
Artisan 1	AT1
Artisan 2	AT2

Table 2

Summary of Main Themes and Sub-themes

Theme One: Technopreneurship Education and Business Intention
 Sub-themes:
 1. School entrepreneurship course (SC) and business intention (BI)
 2. School entrepreneurship practical (SP) and business intention (BI)
 3. School internet facility (SI) and business intention (BI)
 4. Influence of technopreneurship education (i.e., combination of SC, SP and SI) on intention

Theme Two: Perceived Challenges of Technopreneurship
 Sub-themes:
 1. Inadequate facility
 2. Financial constraint

Theme Three: Suggested Measures for Promoting Technopreneurship Education
 Sub-theme:
 1. Adequate facility
 2. Availability of fund for business start-up
 3. Registration of students with CAC (Corporate Affairs Commission)

Ethical Considerations

    To avoid problems that normally occur between the rights of the participants' privacy and the researcher, the participant consent to partake in the study was given using participants' informed consent form. Also, a cordial relationship was established to ensure participants' disposition to participate in the study (Creswell, 2012).

Quantitative Findings

Hereunder, I present the quantitative findings derived from the study. While analyzing the students' level of awareness on technopreneurship, following data was revealed.

Figure 2

Level of Students'Awareness of Technopreneurship
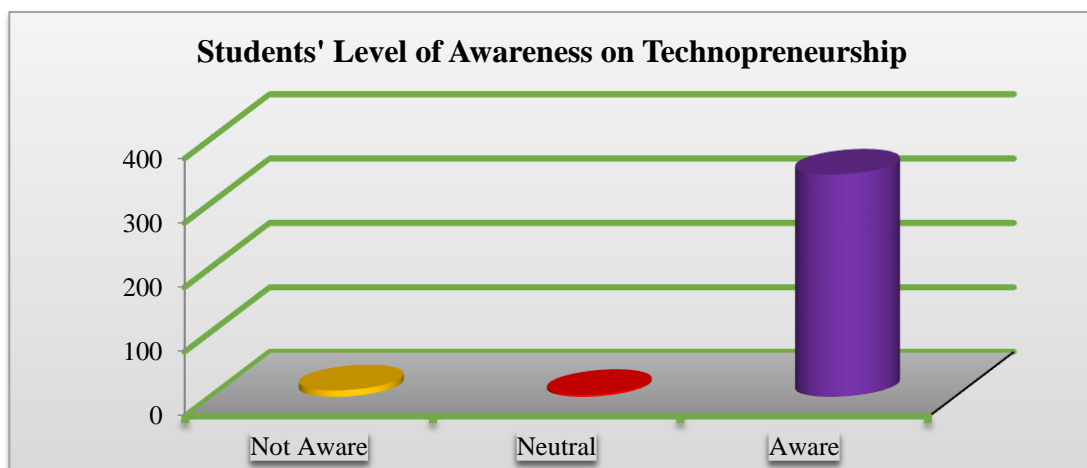
The above figure depicts the students' level of awareness on technopreneurship based on the descriptive analysis of the study. Specifically, the analysis shows that 11 (3%) respondents were not aware of technopreneurship, 6 (2%) respondents were neutral, while 341 (95%) respondents were aware of it. Based on the foregoing, thus it suggests that majority of the respondents have awareness on technopreneurship.

Analysis of PLS Path Results

The PLS-SEM is a known statistical tool for path model estimation with reference to variables and their relationships. This section describes the two steps on how path models of the study conceptual framework were estimated using PLS-SEM (Henseler et al., 2009). In analyzing path models, two procedures were followed, they are measurement model assessment, and structural model assessment.

(a) Measurement Model Assessment of the Study

Measurement model is described as the part of the model that assesses the link between the variables and their measures. In this study, individual item reliability, internal consistency, and discriminant validity formed the criteria for determining the measurement model of the study (Hair et al., 2012). The figure displayed below shows the output of the measurement model with the use of PLS-SEM software.

Figure 3

Measurement Model of the Study
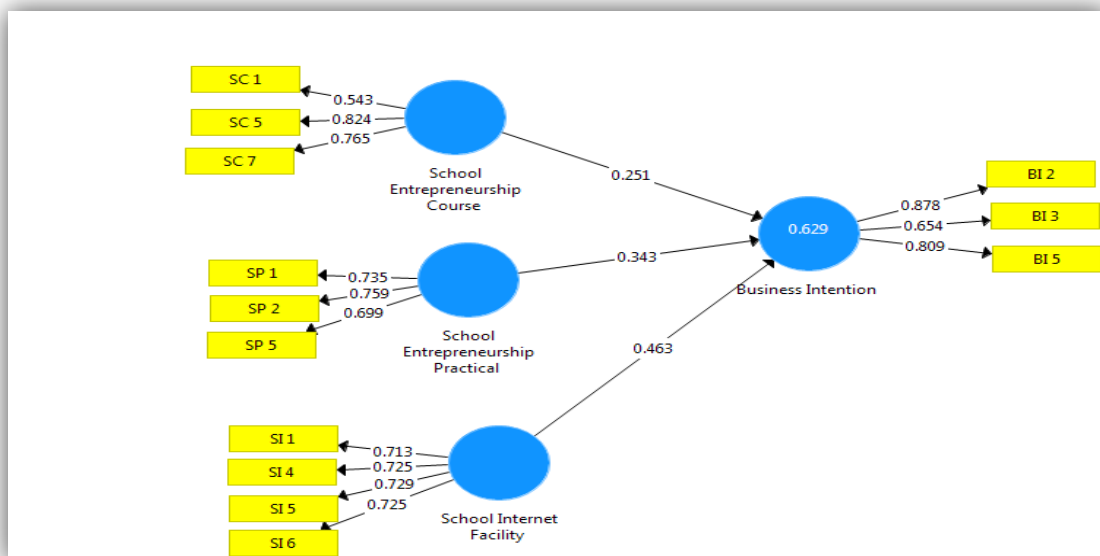
Assessing the Individual Item and Consistency of the Model. Following the suggestion of Henseler et al. (2009), of the .40 as minimum benchmark for determining adequate reliability of individual item in research, all items contained in the measurement model loaded more than .40, which is the minimum benchmark. Specifically, the items in the model had loading between .548 and .878, indicating adequate loading of items. Furthermore, according to McCrae et al. (2011), composite reliability is described as the most conventional way of determining the internal consistency reliability of adapted or adopted instrument in research. Therefore, in this study, composite reliability was adopted for two reasons. First, it is assumed that Cronbach's alpha underestimates the true reliability of the scale because it is well known when the correlation is lower. Second, unlike Cronbach's alpha, composite

reliability measures the overall reliability of a collection of heterogeneous with related items (Henseler et al., 2009). The table below indicates the composite reliability of the study model.

Table 3

Composite Reliability and AVE

	Composite Reliability	Average Variance Extracted
Business Intention	0.827	0.617
School Entrepreneurship Course	0.759	0.520
School Entrepreneurship Practical	0.775	0.535
School Internet Facility	0.814	0.523

Assessing Convergent and Discriminant Validity of the Model. According Hair et al. (2012), convergent validity entails the sub-type of the construct validity of the model. It can also be described as the measure of a certain construct because it takes into consideration constructs that are meant to measure the same construct and signifies that they are truly connected. In consonance with Fornell and Larcker's (1981) process for determining the AVE of each model, it is presumed that the AVE (minimum of 0.5) estimates measure the exact variance that is captured by a particular construct based on measurement error. Thus, the AVE estimates of the current study as shown in Table 1 reveal adequate convergent validity of the study model. Specifically, the AVEs of business intention (BI), school entrepreneurship course (SC), school entrepreneurship practical (SP) and school internet facility (SI) loaded at 0.617, 0.520, 0.535 and 0.523 respectively, showing that the variance in the indicators were clearly explained by common factors. In addition, Chin (2010) described discriminant validity as the two measures that are not supposed to related, are unrelated and that a value less than 0.75 indicates that discriminant validity likely exists between the two scales. In consonance with Chin's (2010) benchmark, the discriminant validity for the constructs of the current study (BI: 0786; SC 0.721; SP: 0.731; SI: 0.723) indicates a good discriminant validity (see Table 2). Furthermore, as explained earlier that discriminant validity indicates that a test of a concept is not extremely correlated with other tests that is designed to measure the theoretically different concepts. Table 5 equates the cross loadings of the current study constructs, signifying adequate discriminant validity.

Table 4

Discriminant Validity

	BI	SC	SP	SF
Business Intention	**0.786**			
School Entrepreneurship Course	0.488	**0.721**		
School Entrepreneurship Practical	0.527	0.243	**0.731**	
School Internet Facility	0.671	0.331	0.363	**0.723**

*Note: All the items in bold color indicate adequate discriminant validity

Table 5

Crossloadings

	Business Intention	School Entrepreneurship Course	School Entrepreneurship Practical	School Internet Facility
B12	**0.878**	0.432	0.258	0.710
BI3	**0.654**	0.353	0.465	0.331
B15	**0.809**	0.366	0.632	0.505
SC1	0.303	**0.543**	0.334	0.349
SC5	0.283	**0.824**	0.112	0.120
SC7	0.425	**0.765**	0.100	0.235
SI1	0.356	0.302	**0.713**	0.268
SI4	0.627	0.379	**0.725**	0.167
SI5	0.398	0.171	**0.729**	0.096
SI6	0.470	0.066	**0.725**	0.529
SP1	0.405	0.191	0.282	**0.735**
SP2	0.483	0.173	0.384	**0.759**
SP5	0.350	0.170	0.087	**0.699**

(b) Structural Model Assessment of the Study

After successful assessment of the psychometric properties of the study measurement model, the psychometric properties of the structural model were equally assessed. This enabled to obtain the significance paths of the model based on the hypotheses. Before structural model assessment, adequate bootstrapping of the model

was performed using 1000 values to estimate a sample of 358 cases with the use of PLS. The outcome of the bootstrapping is given in Figure 4 and Table 4 below:

Figure 4

Structural Model of the Study
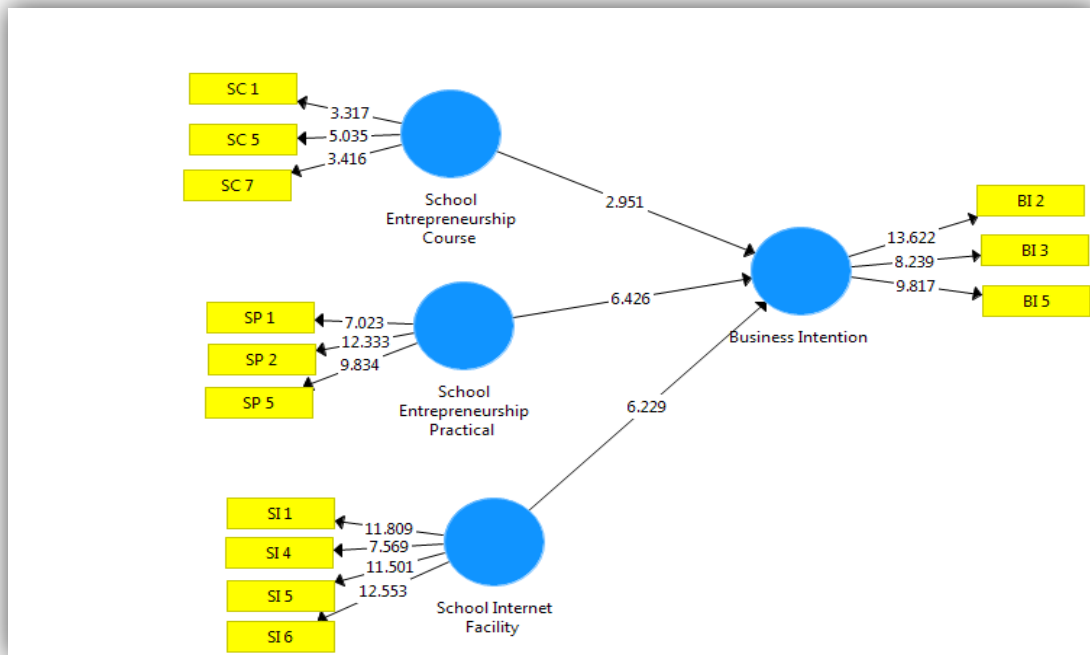
Table 6

Table of Significance

Hypotheses Testing	Mean	Standard Deviation	T Statistics	P Values	Decision
H1: SC >Business Intention	0.256	0.085	2.951	0.003	Accepted
H2: SP >Business Intention	0.342	0.053	6.426	0.000	Accepted
H3: SI>Business Intention	0.441	0.074	6.229	0.000	Accepted
H4: SC-SP-SI > Business Intention	0.384	0.062	6.317	0.000	Accepted

Note: SC connotes School Entrepreneurship Course; SP = School Entrepreneurship Practical; SI = School Internet Facility

Table 7

Effect Size of the Model

	R-Square	R-Square Adjusted
Business Intention	0.629	0.618

Table 8

Students' Perceived Challenges of Technopreneurship Education

S/N	Statements	SA	A	U	D	SD
1	Inadequate facility	**221 (61.7%)**	**128 (35.8%)**	**3 (0.8%)**	**5 (1.4%)**	**1 (0.3%)**
2	Financial constraint for business start-up	**346 (96.6%)**	**11 (3.1%)**	**1 (0.3%)**	**0 (0.0%)**	**0 (0.0%)**

Table 9

Students' Perceived Measures to Address Challenges of Technopreneurship Education

S/N	Statements	SA	A	U	D	SD
1	Adequate facility	197 (55.0%)	146 (40.8%)	10 (2.8%)	5 (1.4%)	0 (0.0%)
2	Availability of fund for business start-up	351 (98.0%)	7 (2.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Qualitative Findings

Hereunder, I present the qualitative findings derived from the study.

Technopeneurship Education and Business Intention

The theme one generated from the coding process is technopreneurship education and business intention, and it has four sub-themes that are discussed below:

School Entrepreneurship Course and Business Intention

Participants' excerpts on influence of entrepreneurship course on business intention are given below:

According to LC 1 & 2, the inclusion of entrepreneurship course in the university's curriculum is a welcome development. Since the introduction of the policy, it has really assisted students in terms of embracing business after graduation. In support, AT2 acknowledged the fact that students' exposure to theoretical aspect of entrepreneurship would assist them a lot before starting the practical aspect of it. Similarly, AT1 opined that the policy on entrepreneurship course in the universities and other higher institutions of learning has contributed immensely to students' intention to start business.

School Entrepreneurship Practical and Business Intention

Synopsis of the participants' excerpts on school entrepreneurship practical and business intention are stated below:

If students are allowed to undergo practical aspect of entrepreneurship is a welcome development that be sustained with a view to achieve the desired result, which is to stimulate students' interest in business after graduation (AT1, AT2 and LC1).

In tandem with the above submission, AT2 submitted that allowing students to practical experience of what has been taught in the classroom is a laudable way of reducing unemployment in the country.

School Internet Facility and Business Intention

Honestly, students' access to internet and other gadgets of the university will help them a lot from technological perspective (AT2, LC2 & LC3). The view of AT1 is synonymous with others, he expressed thus…students are addicted to school internet because majority of them are conversant with various social media platforms, which they often use to share ideas as well displaying various products through online.

Influence of Technopreneurship Education (i.e. Combination of SC, SP and SI) on Business Intention

On whether combination of technopreneurship dimensions have the tendency to influence business intention among undergraduate students, participants' excerpts revealed thus:

If students are exposed to both the theoretical and practical aspect of entrepreneurship and merge it technology, it will definitely help students to become

technopreneurs and become self-reliance. Since they are acquitted with the skills necessary to make various products, the next thing is to map out marketing strategy via online platform to draw customers to buy their products (AT1 & LC2).

Similarly, LC1 and AT 2 submitted that…in view of the knowledge that the students acquired from practical and theoretical perspectives, coupled with the technology adoption, they have the ability to explore their potentials to become a successful technopreneurs.

Perceived Challenges of Technopreneurship

The theme two generated from the coding process is perceived challenges of technopreneurship with two sub-themes, namely inadequate facility and financial constraint. The two points are discussed below:

Inadequate Facility

Below is the summary of participants' excerpt on inadequate facility:

One of the challenges that hinder theoretical, practical and technological aspect of technopreneurship education is inadequate facility such as inadequate lecturers for the teaching of entrepreneurship course. Also, there is deficit on equipment (i.e., laboratory, workshop and raw materials) needed for students to engage in practical aspect of entrepreneurship (LC1, LC2, AT1 and AT2).

Financial Constraint

One of the challenges facing students' intention to start business is usually due to financial constraint. Despite the policies on entrepreneurial skills for students in our university, lack of fund has stopped the university from fulfilling its obligations. In the same vein, the issue of finance has been a long problem for students who have potentials for new opportunities. Specifically, some of the students we taught acquired necessary entrepreneurial skills and have come up with viable business ideas but often lack the financial wherewithal to start it (AT1, AT2, LC1 and LC2).

Measures for Promoting Technopreneurship Education

The theme three generated from the coding process is measures for promoting technopreneurship with three sub-themes, namely adequate facility, availability of fund,

and registration of students with CAC (Corporate Affairs Commission). The three points are discussed below:

Adequate Facility

LC1, LC2 and AT2 are of the view that adequate availability of facility is required to promote technopreneurship education in Nigerian universities. Facility in terms of workshops, warehouse, decent classrooms, raw materials, ICT Centre, tablets, internet, generator and other equipment that is necessary for the overall development of students.

Availability of Fund for Business Start-Up

There is need for adequate availability of funds for students who have acquired skills to start *their business. In this regard, stakeholders in education such as government, parents, banks, non-governmental organizations (NGOs) and others need to assist students with brilliant business plan so that the idea of no job after graduation will not be there (AT1, AT2, LC1 and LC2).*

Registration of Students with CAC

AT1 and LC2 agreed that…students who have completed their technopreneurship training in the universities should be assisted with the registration of business name at CAC with the assistance of the assigned lecturers or artisans so that business registration processes can be fast-tracked.

Discussion

I have framed the discussion section aiming at answering each of the research questions set out earlier. Each subtopic corresponds to a research question of this study.

Students' Perceived Level of Awareness of Technopreneurship

In line with the first research question of the study, which is to examine students' perceived level of awareness on technopreneurship, findings of the study indicates that 11 respondents (representing 3%) were not aware of technopreneurship, 6 respondents (representing 2%) were neutral, while 341 respondents (representing 95%) were aware of it. Therefore, it finding suggests that majority of the respondents had awareness on technopreneurship. The foregoing is consistent with the study conducted by Rosly, Junid, Lajin and Rahim (2015) who found similar result on students' awareness. Precisely, the study found high level of students' creativity in science and technology in

Malaysian university. The current finding is also align with the study of Lawal and Yusuf (2019) who found high perceived level of awareness on online material among undergraduate students.

Relationship Between Technopreneurship Education and Business Intention Among Students

In consonance with the second research question of the study, which is to assess the relationship between technopreneurship education and business intention among students, the first research hypothesis postulates that there was significant relationship between school entrepreneurship course and business intention. The PLS path model results indicate a significant relationship between the two variables (SC>BI: mean: 0.256; standard deviation: 0.085; T statistics: 2.951; P-values: 0.003), meaning that students who have attended entrepreneurship course have the propensity to start business. In support, evidence from qualitative finding points to the same direction as lecturers that are teaching students on entrepreneurship course confirmed that the policy initiated by the National Universities Commission (NUC) on entrepreneurship course in universities and other higher institutions of learning in Nigeria contributed immeasurably to students' intention to start business on their own. The current findings are in congruent with the study of Lawal and Yusuf (2019) who established positive association between the two variables. In the same vein, the second research hypothesis of the study postulates that there was significant relationship between school entrepreneurship practical and business intention. The PLS path model results revealed a significant relationship between the two variables (SP>BI: mean: 0.342; standard deviation: 0.053; T statistics: 6.426; P-values: 0.000). In support, evidence from qualitative finding points to the fact that students' exposure to practical of entrepreneurship is a laudable way of reducing youth unemployment. The current findings are in line with the theory of human capital which posits that entrepreneurship is anchored on two important factors, namely education and experience. The theory assumed that knowledge acquisition through experience and education is key to having a clear understanding of variances in business opportunities (Anderson & Miller, 2003; Davidson & Honing, 2003; Kim et al., 2003; Korunka et al., 2003; Shane & Venkataraman, 2000).

Furthermore, the third hypothesis postulates that there was significant relationship between school internet facility and business intention. Interestingly, PLS path model results revealed a significant relationship between the two variables. Interviews conducted with the school lecturers and artisans established that majority of students are conversant with various social media platforms, which they often use to share ideas as well as displaying various products through online. Therefore, the findings of the study imply that if students are given access to use school internet facility for productive means, then it will ginger them to use the provided facility for meaningful things. The findings of the current study align with social network theory which assumes that entrepreneurs are expected to be connected with social network structure that forms a substantial proportion of their opening configuration. The social network theory also postulate that person may have the ability wherewithal to establish that certain entrepreneurial breaks exist, but may lack the social contacts to convert the chance into a business. Hence, access to social link is a significant factor to business success.

The fourth research hypothesis postulates that there was significant relationship between the combined technopreneurship education dimensions (SC-SP-SI) and business intention. As expected, the finding shows that technopreneurship education is significantly related to business intention. In support, evidence from the interviews conducted revealed that knowledge acquired by students from practical and theoretical perspectives, coupled with the technology adoption, can help the students to explore their potentials with a view to become successful technopreneurs in their endeavours. The findings of the current study are in agreement with the work of Harsono (2013) who confirmed that established entrepreneurship education is necessary to build entrepreneurial human capital for university students. And entrepreneurship programs and modules, as well as teaching methods to raise and motivate students in terms of innovation as a way of encouraging students to embrace technopreneurial prospects

Challenges Facing Technopreneurship Education

In agreement with the third research question of the study, which is based on identifying the challenges facing technopreneurshp education. Descriptive analysis with the use of SPSS revealed two major challenges facing tehnopreneurship education, namely inadequate facility (strongly agreed: 61.7%; agreed: 35.8%) and financial

constraint (strongly agreed: 96.6%; agreed: 3.1%). Similarly, interviews conducted with the lecturers and artisans supports the evidence from quantitative results as they confirmed that factors that hinder theoretical, practical and technological aspect of technopreneurship are financial constraint and inadequate facility, which includes inadequate lecturers for the teaching of entrepreneurship course as well as inadequate artisans to mentor students during entrepreneurship practical. These findings corroborate the studies conducted by Kamarudin and Sajilan (2013), Olokundun et al. (2014) and Uduak and Aniefiok (2011) who found various challenges militating against technopreneurship which include lack of access to financial resources, lack of skilled talent, unclear government policies, local market limitation and business sustainability issue.

Measures to Address the Challenges of Technopreneurship Education

In line with the fourth research question, which is based on measures that can be used to address the challenges of tecnhopreneurship, evidence from quantitative finding revealed two measures that can be used to address the challenges. They include adequate facility (strongly agreed: 55.0%; agreed: 40.8%) and availability of fund (strongly agreed: 98.0%; agreed: 2.0%). Similarly, evidence from qualitative approach supports the quantitative evidence and offers additional measure of addressing challenges of technopreneurship which is registration of students with the Corporate Affairs Commission (CAC), this will stimulate students' interest in business. These findings are in agreement with the work of Abdulrasheed et al. (2019) who established financial support for students' entrepreneurial development as panacea to the bane of youth unemployment.   Also, the study of Kamarudin and Sajilan (2013) concluded that government assistance is a great contributor to the success of entrepreneurs.

Conclusion

Based on the findings of the study, the study concluded that technopreneurship education in Nigerian universities is of paramount importance to economic growth of any nation specifically the evolving countries like Nigeria. Since empirical evidence via the sequential mixed-method approach used for the study had established link between technopreneurship education and business intention, therefore, it can be said that technopreneurship is an effective strategy that can be used to reduce unemployment in Nigeria. Aside that, the findings of the study offers immense contribution to the body of

knowledge from three practical, theoretical and methodological points of view. From practical perspective, findings of the study will be useful to government and management on how technopreneurship can be incorporated in university curriculum as well as how it can be successfully implemented to reduce youth employment in Nigeria. Specifically, since the proposed model on technopreneurship education in Nigerian universities has been tested empirically in this study, therefore, the entrepreneurship aspect of university curriculum should be reviewed by the NUC for incorporation of technopreneurship so that technology can be merged with entrepreneurship. Also, the study will be useful to government, banks, philanthropists, NGOs and other stakeholders in education on how to provide financial assistance for students who have intention in becoming technopreneurs. From theoretical perspective, both human capital and social network aspect of resource-based theory of entrepreneurship has been validated in this study because human capital theory posits that entrepreneurship is attached to experience and education while social network assumes that businesses are connected with social network structure that generates a substantial share of their openings. From methodological perspective, the current study adapted instrument from the previous studies conducted by Olokundun et al. (2014) and Tung (2011) to elicit relevant data from the respondents. Also, the use of survey and interview to investigate the current study is another important methodological contribution.

References

Abdulrasheed, J., Suleiman, Y., Bolaji, H. O.. & Tunbosun, L. A. (2019). Assessing the impact of entrepreneurship course on entrepreneurial intention: A case study of Al-Hikmah University undergraduate students. *Amity Journal of Entrepreneurship, 4*(1), 1-14. https://amity.edu/UserFiles/admaa/4a51dPaper%201.pdf

Aboluwodi, A. (2018). Deploying creative thinking to strengthen entrepreneurial capability among university students in Nigeria. *Journal of Education and Research, 8*(2), 93-108. https://doi.org/10.3126/jer.v8i2.27381

Aldrich, H., & Cliff, J. (2003). The pervasive effect of family on entrepreneurship: Toward a family embeddedness perspective. *Journal of Business Venturing, 18*(5), 573–596.

Anderson, A. R., & Miller, C. J. (2003). Class matters: Human and social capital in the entrepreneurial process. *The Journal of Socio-economics*, *32*(1), 17-36.

Bassey, U. U., & Olu D. (2008). Tertiary education and graduate self-employment potentials in Nigeria. *Journal of the World Universities Forum, 1*(3), 131-42.

Chin, W. (2010). How to write up and peport PLS analyses. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares* (pp. 655-690). Springer.

Clausen, T. H. (2006). *Who identifies and exploits entrepreneurial opportunities.* https://bit.ly/3xd9fSq

Colombo, M. G., & Delmastro, M. (2002). How effective are technology incubators? Evidence from Italy. *Research Policy*, *31*(7), 1103-1122.

Davidson, P., & Honing, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, *20*, 121.

Federal Republic of Nigeria. (2013). *National policy on education.* NERDC.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*, 39-50.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2012). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 18*, 139-152.

Harsono, A. (2013). Building technopreneurship for next generation: How the benefits of technoentrepreneurship education affect career intentions of college students. *Sisfotenika*, *3*(1), 31-40.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least Squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), *Advances in international marketing* (Vol. 20, pp. 277-320). Emerald.

International Labor Organization. (2016). *Facing growing unemployment challenges in Africa.* https://www.ilo.org/africa/media-centre/pr/WCMS_444474/lang-en/index.htm

International Labor Organization. (2019). *Youth unemployment rate in Africa.* https://7dnews.com/news/africa-s-youth-unemployment-rate-to-exceed-30-in-2019-ilo

Kamarudin, H. S., & Sajilan, S. (2013). Critical success factors of technopreneurship in the creative industries: A study of animation ventures. *Review of Integrative Business and Economics Research, 2*(1), 1-36.

Kim, P. H., Aldrich, H. E., & Keister, L. A. (2003, January). If I were rich? The impact of financial and human capital on becoming a nascent entrepreneur. In *Annual Meeting of the American Sociological Association, Atlanta*.

Korunka, C., Frank, H., Lueger, M., & Mugler, J. (2003). The entrepreneurial personality in the context of resources, environment, and the startup process – A configurational approach. *Entrepreneurship Theory and Policy, 28*(1), 23-42.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*, 607-610.

Lawal, A. T. & Yusuf, S. (2019, July 28-31). *Impact of technopreneurship education* [Paper presentation]. Isteams Conference, University of Ghana, Legon.

McCrae, R. R., Kurtz, J. E., Yamagata, S., & Terracciano, A. (2011). Internal consistency, retest reliability, and their implications for personality scale 239validity. *Personality & Social Psychology Review, 15*(1), 28-50. https://doi.org/10.1177/1088868310366253

Mursityo, Y. T., Astuti, E. S., & Suharsono, E. G. (2017). Technopreneurship intentions in faculty of computer science brawijaya university students. *Journal of Applied Management, 15*(2), 320-329.

National Bureau of Statistics. (2018). *Unemployment rate in Nigeria.* https://nigerianstat.gov.ng.

Olokundun, M., Hezekiah, F., Stephen, I., & Fred, I. (2014). An assessment of the taught entrepreneurship program in Nigerian secondary schools. *Merit Research Journal of Education and Review, 2*(11), 257-275.

Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS for Windows*. Open University Press.

Rosly, H. E., Junid, J., Lajin, N. F. M., & Rahim, H. L. (2015). The relationship of creativity and technopreneurship intention. *International Academic Research Journal of social Science, 1*(1), 8-15.

Rothschild, L., & Darr, A. (2003). Technological incubators and the social construction of innovation networks: An Israeli case study. *Technovation, 25*(1), 59–69.

Sekaran, U., & Bougie, R. (2010). *Research methods for business - A skill building approach* (5th ed.). Wiley.

Selvarany, A., & Venusamy, K. (2015). A study of technopreneurship in small and medium industry. Technopreneurship as a firm strategy: Links to innovation, creation and performance. *International Journal of Management, 6*(1), 401-408.

Shane, S. A., & Eckhardt, J. T. (2003). Opportunities and entrepreneurship. *Journal of Management*, *29*(3), 333-349.

Shane, S. A., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review, 25*(1), 217-226.

Suzuki, K., Kim S. H., & Bae, Z. T. (2002). Entrepreneurship in Japan and Silicon Valley: A comparative study. *Technovation, 22*, 595–606.

Tung, L. C. (2011). *The impact of entrepreneurship education on entrepreneurial intention of engineering students* [Doctoral thesis]. City University of Hong Kong. https://bit.ly/3sqPfIi

Uduak, I. E., & Aniefiok, O. E. (2011). Entrepreneurship education and career intentions of tertiary education students in Akwa Ibom and Cross River States, Nigeria. *International Education Studies, 4*(1), 172-178.

United Nations Development Program. (2019). *The 2030 sustainable development agenda.* https://sustainabledevelopment.un.org/?menu=1300

United Nations Population Fund. (2019). *World population*. https://www.unfpa.org/

Annex: Proposed Technopreneurship Model in Nigerian Universities

UNIVERSITY SYSTEM

School Entrepreneurship Course

- Recruitment of qualified lecturers to teach the course
- Availability of relevant materials on entrepreneurship
- Availability of classroom

School Entrepreneurship Practical

➢ Recruitment of artisans and supporting staff
➢ Availability of workshops/Laboratories & Raw materials
➢ Grouping of students into area of interest

Incorporation of Technopreneurship Education in University Curriculum

School Facilities
✓ Provision of tablets for students
✓ Provision of internet
✓ Access to ICT unit
✓ Student display of made products

Employment
Provision of capital to students to start business

Business Intention

- Student identification of business interest
- Development and approval of students' business proposals
- Registration with CAC

Provision of Funds for Business

➢ Government
➢ Parents
➢ Banks, NGOs etc.